

The documentation and process conversion measures necessary to comply with this document shall be completed by 22 September 2014.

INCH-POUND
MIL-PRF-19500/586L
26 March 2014
SUPERSEDING
MIL-PRF-19500/586K
22 April 2011

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, DIODE, SILICON, SCHOTTKY BARRIER,
TYPES 1N5817-1, 1N5817UR-1, 1N5819-1, 1N5819UR-1, 1N6761-1, AND 1N6761UR-1,
JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and [MIL-PRF-19500](#).

1. SCOPE

1.1 Scope. This specification covers the performance requirements for silicon, Schottky barrier diodes. Four levels of product assurance are provided for each encapsulated device types as specified in [MIL-PRF-19500](#). Two levels of product assurance are provided for unencapsulated devices (die) as specified in [MIL-PRF-19500](#).

1.2 Physical dimensions. The device package styles are as follows: Axial leaded DO-204AL (formerly DO-41) in accordance with [figure 1](#) for device types 1N5817-1, 1N5819-1, and 1N6761-1, metal electrode leadless face (MELF) DO-213AB in accordance with [figure 2](#) for device types 1N5817UR-1, 1N5819UR-1, and 1N6761UR-1, and unencapsulated die in accordance with [figure 3](#) for device types JANHC and JANKC.

1.3 Maximum ratings. Unless otherwise specified, $T_A = +25^\circ\text{C}$.

Types	V_{RWM} (1)	$I_{O(PCB)}$ $T_A = 55^\circ\text{C}$ (2)	I_{FSM}	$R_{\theta JL}$ $L = .375 \text{ inch}$ (9.53 mm)	Max $R_{\theta JEC}$ (2)	Max $R_{\theta JA}$	T_J (3)	T_{STG}
	V (pk)	A dc	A dc		$^\circ\text{C/W}$	$^\circ\text{C/W}$	$^\circ\text{C}$	$^\circ\text{C}$
1N5817-1	20	1.0	25	70		220	-65 to +125	-65 to +150
1N5817UR-1	20	1.0	25		40	220		
1N5819-1	45	1.0	25	70		220	-65 to +125	
1N5819UR-1	45	1.0	25		40	220		
1N6761-1	100	1.0	25	70		220	-65 to +150	
1N6761UR-1	100	1.0	25		40	220		

(1) See [figures 4, 5, 6, 7, 8, and 9](#) for derating curves and for effects of V_R on T_J . $T_A = +75^\circ\text{C}$ for both axial leaded and MELF (UR) on printed circuit board (PCB), PCB = FR4 - .0625 inch (1.59 mm) 1-layer 1-Oz Cu, horizontal, in still air; pads for UR = .061 inch (1.55 mm) x .105 inch (2.67 mm); pads for axial leaded = .092 inch (2.34 mm) diameter, strip = .030 inch (0.76 mm) x 1 inch (25.4 mm) long, lead length $L \leq .187 \text{ inch}$ ($\leq 4.75 \text{ mm}$); $R_{\theta JA}$ with a defined PCB thermal resistance condition included, is measured at $I_O = 1 \text{ A}$.

(2) For thermal impedance see [figures 10 and 11](#).

(3) The maximum T_J depends on the voltage applied.

Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAC, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to Semiconductor@dlamail. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

1.4 Primary electrical characteristics. Unless otherwise specified, $T_A = +25^\circ\text{C}$.

Types	Max V_{F1} $I_F = 0.1 \text{ A}$	Max V_{F2} $I_F = 1.0 \text{ A}$	Max V_{F3} $I_F = 3.1 \text{ A}$	Max I_{RM} @ V_{RWM} pulsed method (see 4.5.1)		Max C_T $V_R = 5 \text{ V dc}$
				$T_J = +25^\circ\text{C}$ I_{RM1}	$T_J = +100^\circ\text{C}$ I_{RM2}	
	<u>V (pk)</u>	<u>V (pk)</u>	<u>V (pk)</u>	<u>μA</u>	<u>mA</u>	<u>pF</u>
1N5817-1	.32	.45	.65	50	5.0	110
1N5817UR-1	.32	.45	.65	50	5.0	110
1N5819-1	.34	.49	.80	50	5.0	70
1N5819UR-1	.34	.49	.80	50	5.0	70
1N6761-1	.38	.69	NA	100	12.0	70
1N6761UR-1	.38	.69	NA	100	12.0	70

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

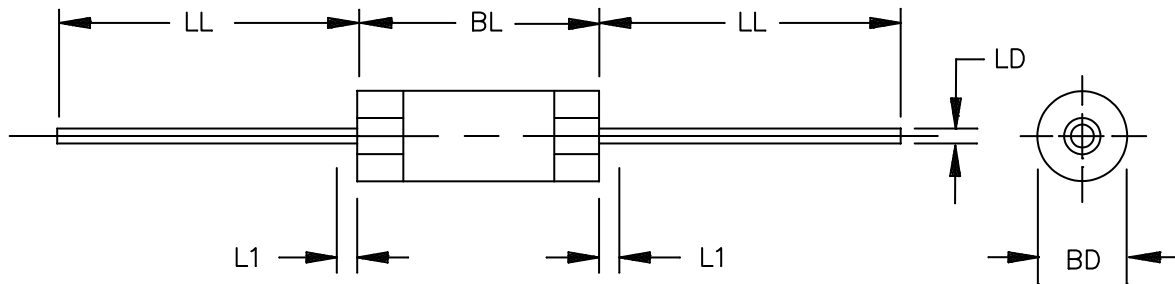
MIL-PRF-19500 – Semiconductor Devices, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-750 – Test Methods for Semiconductor Devices.

(Copies of these documents are available online at <http://quicksearch.dla.mil>.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.



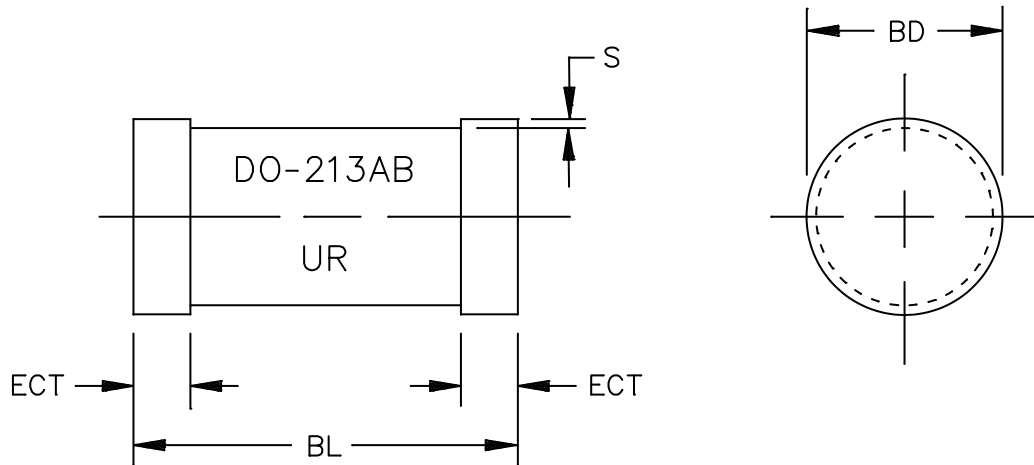
Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	.080	.107	2.03	2.72	2
BL	.160	.205	4.06	5.21	2
LD	.028	.034	0.71	0.86	
LL	1.000		25.40		
L1		.050		1.27	3

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Package contour optional within cylinder of diameter BD and length BL. Slugs, if any, shall not be included within this cylinder, but shall not be subject to the minimum limit of BD.
3. Lead diameter not controlled in this zone to allow for flash, lead finish build-up, and minor irregularities other than slugs.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

Types 1N5817-1, 1N5819-1 and 1N6761-1

FIGURE 1. Physical dimensions for axial lead devices (DO-204AL, formerly DO-41).



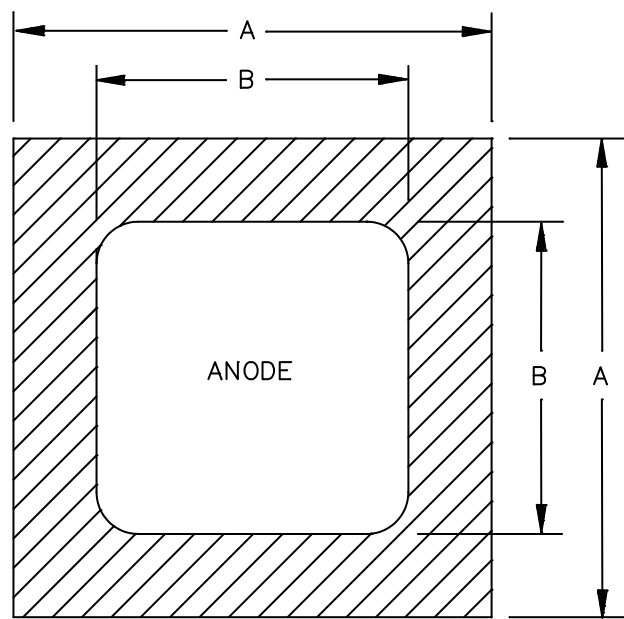
Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.094	.105	2.39	2.67
BL	.189	.205	4.80	5.21
ECT	.016	.022	0.41	0.56
S	.001		0.03	

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

Types 1N5817UR-1, 1N5819UR-1, and 1N6761UR-1

FIGURE 2. Physical dimensions for MELF devices (DO-213AB).



BACKSIDE IS CATHODE

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.035	.039	0.89	0.99
B	.031	.033	0.79	0.84

Design data	
Metallization:	
Top (anode):	Al
Back (cathode):	Au
Al thickness	25,000 Å minimum
Ag thickness	4,000 Å minimum
Chip thickness	.010 ±.002 inch (0.254 ±0.051 mm)

FIGURE 3. Physical dimensions for unencapsulated die (A and B version for JANHC and JANKC).

3. REQUIREMENTS

3.1 General. The individual item requirements shall be as specified in [MIL-PRF-19500](#) and as modified herein.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list (QML) before contract award (see [4.2](#) and [6.3](#)).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in [MIL-PRF-19500](#).

3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in [MIL-PRF-19500](#), and herein. The device package styles are as follows: Axial leaded DO-204AL (formerly DO-41) in accordance with [figure 1](#) for device types 1N5817-1, 1N5819-1, and 1N6761-1, DO-213AB (MELF) in accordance with [figure 2](#) for device types 1N5817UR-1, 1N5819UR-1, and 1N6761UR-1, and unencapsulated die in accordance with [figure 3](#) for device types JANHC and JANKC.

3.4.1 Lead material and finish. Lead material shall be copper clad steel with a minimum of 50 percent copper by weight. The lead finish shall be solderable in accordance with [MIL-STD-750](#), [MIL-PRF-19500](#), and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see [6.2](#)).

3.4.2 Polarity. The polarity of all packaged device types shall be indicated with a contrasting color band to denote the cathode end. Alternatively, for UR suffix devices, a minimum of three contrasting color dots spaced around the periphery on the cathode end may be used. The polarity of unencapsulated die shall be as identified on [figure 3](#).

3.4.3 Diode construction. All devices shall be metallurgically bonded, double plug construction in accordance with the requirements of [MIL-PRF-19500](#). All glass diodes shall be designed with sufficient thermal compensation in the axial direction to optimize tensile and compressive stresses. Dimensional analysis is required of all materials used to achieve axial thermal compensation. Dimensional tolerances and corresponding coefficient of thermal expansion (CTE) shall be documented on the DLA Land and Maritime Design and Construction Form 36D and shall be approved by the qualifying activity to maintain qualification. Dimensional tolerances shall be sufficiently tight enough to prevent excessive stresses due to the inherent CTE mismatch. The UR suffix devices (DO-213AB) shall be structurally identical to the non-UR suffix devices except for end-cap lead attachment.

3.5 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I.

3.6 Electrical test requirements. The electrical test requirements shall be as specified in table I herein.

3.7 Marking.

3.7.1 Axial lead devices. Marking shall be in accordance with MIL-PRF-19500. Manufacturer's identification and date code shall be marked on the devices. Initial container package marking shall be in accordance with MIL-PRF-19500. The polarity shall be indicated with a contrasting color band to denote the cathode end. The prefixes JAN, JANTX, JANTXV, and JANS may be abbreviated as J, JX, JV, and JS respectively. Manufacturer's identification and date code shall be marked on the devices. The part number may be reduced to J5817, JX5817, JV5817, or JS5817. Color coding shall not be permitted for part numbering.

3.7.2 MELF surface mount devices (UR versions). For UR suffix devices only, all marking, except polarity may be omitted from the body, but shall be retained on the initial container.

3.8 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Screening (see 4.3).
- c. Conformance inspection (see 4.4 and tables I and II).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.2.1 Group E qualification. Group E inspection shall be performed for qualification or re-qualification only. In case qualification was awarded to a prior revision of the specification sheet that did not require the performance of table II tests, the tests specified in table II herein that were not performed in the prior revision shall be performed on the first inspection lot of this revision to maintain qualification.

4.2.2 Qualification of unencapsulated die (JANHC and JANKC devices). Qualification inspection for unencapsulated die shall be in accordance with appendix G of MIL-PRF-19500. This qualification testing may be performed with the die mounted in a TO-5 package in lieu of the DO-41 axial leaded package.

4.3 Screening.

4.3.1 Screening of packaged devices (JANTX, JANTXV and JANS levels only). Screening of packaged devices shall be in accordance with table E-IV of MIL-PRF-19500, and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table E-IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTXV and JANTX level
2	Not required	Not required
3b	Not applicable	Not applicable
3c (1)	Required (see 4.3.1.3)	Required (see 4.3.1.3)
4, 5, and 6	Not applicable	Not applicable
9	I_{R1} and V_{F2}	Not applicable
10 (2)	$T_A = +110^\circ\text{C}$; $V_{RWM} = 20 \text{ V(pk)}$, 1N5817, $T_A = +110^\circ\text{C}$; $V_{RWM} = 45 \text{ V(pk)}$, 1N5819, $T_A = +100^\circ\text{C}$; $V_{RWM} = 100 \text{ V(pk)}$, 1N6761, $I_O = 0$, $V_R = V_{RWM}$	$T_A = +110^\circ\text{C}$; $V_{RWM} = 20 \text{ V(pk)}$, 1N5817, $T_A = +110^\circ\text{C}$; $V_{RWM} = 45 \text{ V(pk)}$, 1N5819, $T_A = +100^\circ\text{C}$; $V_{RWM} = 100 \text{ V(pk)}$, 1N6761, $I_O = 0$, $V_R = V_{RWM}$
11	$\Delta I_{R1} \leq 100$ percent of initial reading or .02 mA, whichever is greater. $\Delta V_{F2} \leq \pm 50 \text{ mV dc}$	I_{R1} and V_{F2}
12	See 4.3.1.2	See 4.3.1.2
13	Subgroup 2 of table I herein; $\Delta I_{R1} \leq 100$ percent of initial reading or .02 mA, whichever is greater; $\Delta V_{F2} \leq \pm 50 \text{ mV dc}$	Subgroup 2 of table I herein; $\Delta I_{R1} \leq 100$ percent of initial reading or .02 mA, whichever is greater; $\Delta V_{F2} \leq \pm 50 \text{ mV dc}$

- (1) Thermal impedance shall be performed any time after sealing provided temperature cycling is performed in accordance with table E-IV of MIL-PRF-19500, screen 3 prior to this thermal test.
- (2) Test time shall be 48 hours minimum. T_J is not to exceed $+115^\circ\text{C}$ at V_{RWM} . T_J is affected by the device mounting thermal resistance when parasitic power is generated by the temperature dependent leakage current. Until this leakage becomes significant near thermal runaway, T_J remains approximately equal to T_A or T_J for $I_O = 0$.

4.3.1.1 JAN testing. JAN level product will have temperature cycling and thermal impedance testing performed in accordance with MIL-PRF-19500, JANTX level screening level requirements.

4.3.1.2 Burn-in conditions. Burn-in conditions shall be as follows: $I_F = 1.0 \text{ A dc}$ (minimum), adjust I_F or T_A to achieve $T_J = +100^\circ\text{C min}$. Mounting and test conditions shall be in accordance with method 1038 of MIL-STD-750, test condition B.

4.3.1.3 Thermal impedance. The thermal impedance measurements shall be performed in accordance with method 3101 or 4081 of MIL-STD-750 using the guidelines in that method for determining I_M , I_H , t_H , t_{SW} . Measurement delay time (t_{MD}) = 70 μs maximum. See table II group E, subgroup 4 herein.

4.3.2 Screening of unencapsulated die (JANHC or JANKC). Screening of unencapsulated die shall be in accordance with appendix G of MIL-PRF-19500 and as specified herein. Die shall be 100-percent probed in accordance with table I, subgroup 2. Die that exceed the limits of table I herein shall not be acceptable.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with table E-V of MIL-PRF-19500 and table I herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the tests and conditions specified for subgroup testing in table E-VIA (JANS), and E-VIB (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and as follows herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein.

4.4.2.1 Quality level JANS (table E-VIA of MIL-PRF-19500).

Subgroup	Method	Conditions
B3	1056	0°C to +100°C, 25 cycles.
B3	1051	-55°C to +150°C, 100 cycles.
B3	4066	I _{FSM} = 25 A (pk), condition A, I _O = 1.0 A; T _A = room ambient as defined in the general requirements of MIL-STD-750 (see 4.5); 5 surges of t _p = 8.3 ms each at 1 minute intervals.
B3	2101	Decap analysis; scribe and break only.
B3	2075	In accordance with 4.5.3.
B4	1037	I _F = 1.0 A; T _A = room ambient as defined in the general requirements of MIL-STD-750; t _{on} = t _{off} = 3 minutes minimum for 2,000 cycles.
B5	1026	I _F = 1 A dc (minimum), adjust I _F or T _A to achieve T _J = +125°C (minimum).
B6	4081	See 4.3.1.3; R _{θJL} and R _{θJEC} only.

4.4.2.2 Quality levels JAN, JANTX, and JANTXV (table E-VIB of MIL-PRF-19500).

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
B2	1056	0°C to +100°C, 10 cycles.
B2	1051	-55°C to +150°C, 25 cycles.
B2	4066	$I_{FSM} = 25$ A (pk), condition A, $I_O = 1.0$ A; T_A = room ambient as defined in the general requirements of MIL-STD-750 (see 4.5); 5 surges of $t_p = 8.3$ ms each at 1 minute intervals.
B3	1027	$I_F = 1$ A dc (minimum), adjust I_F or T_A to achieve $T_J = +125^\circ\text{C}$ minimum.
B4	2101	Decap analysis; scribe and break only, see 4.5.3.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table E-VII of MIL-PRF-19500. Electrical measurements (end-points) shall be in accordance with the applicable inspections of table I, subgroup 2 herein.

<u>Subgroup</u>	<u>Method</u>	<u>Conditions</u>
C2	1056	0°C to +100°C, 10 cycles.
C2	1051	-55°C to +150°C, 25 cycles.
C2	2036	Tension: Test condition A; weight = 12 pounds (5.44 kg); $t = 15$ s. Lead fatigue: Test condition E; weight = 1 pound (0.45 kg). NOTE: Neither tension nor lead fatigue are applicable for UR devices.
C5	4081	See 4.3.1.3; $R_{\theta JL}$ and $R_{\theta JEC}$ only.
C6	1027	$I_F = 1$ A dc (minimum), adjust I_F or T_A to achieve $T_J = +125^\circ\text{C}$ minimum.

4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with table E-IX of MIL-PRF-19500 and the conditions for subgroup testing in table II herein. Electrical measurements (end-points) shall be in accordance with the applicable inspections of table I, subgroup 2 herein.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables as follows.

4.5.1 Pulse response measurements. The conditions for pulse response measurement shall be as specified in section 4 of MIL-STD-750.

4.5.2 Free air power burn-in and life tests. The use of a current limiting or ballast resistor is permitted provided that each device under test still sees the full P_t (minimum) and that the minimum applied voltage, where applicable, is maintained through-out the burn-in period. Test method 3100 of MIL-STD-750 shall be used to measure T_J .

4.5.3 Decap internal visual scribe and break (DPA). Scratch glass at cavity area with diamond scribe. Carefully snap open. Using 30X magnification, examine the area where die or bond material was in contact with the plug and verify metallurgical bonding area.

TABLE I. Group A inspection.

Inspection 1/ <u>Subgroup 1</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Condition		Min	Max	
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Thermal impedance	3101	See 4.3.1.3	$Z_{\theta JX}$			
Forward voltage	4011					
1N5817-1, 1N5817UR-1		$I_F = .1$ A (pk) pulsed (see 4.5.1)	V_{F1}		.32	V dc
1N5819-1, 1N5819UR-1					.34	V dc
1N6761-1, 1N6761UR-1					.38	V dc
Forward voltage	4011					
1N5817-1, 1N5817UR-1		$I_F = 1.0$ A (pk) pulsed (see 4.5.1)	V_{F2}		.45	V dc
1N5819-1, 1N5819UR-1					.49	V dc
1N6761-1, 1N6761UR-1					.69	V dc
Forward voltage	4011					
1N5817-1, 1N5817UR-1		$I_{FM} = 3.1$ A (pk) pulsed (see 4.5.1)	V_{F3}		.65	V dc
1N5819-1, 1N5819UR-1					.80	V dc
Reverse current leakage	4016	Pulse method				
1N5817-1, 1N5817UR-1		$V_{RM} = 20$ V (pk)	I_{R1}		70	μ A
1N5819-1, 1N5819UR-1		$V_{RM} = 45$ V (pk)			50	μ A
1N6761-1, 1N6761UR-1		$V_{RM} = 100$ V (pk)			100	μ A
<u>Subgroup 3</u>						
High temperature operation:		$T_A = +100^\circ\text{C}$				
Reverse current leakage	4016	Pulse method (see 4.5.1)				
1N5817-1, 1N5817UR-1		$V_{RM} = 20$ V (pk)	I_{R2}		5.0	mA
		$V_{RM} = 12$ V (pk)	I_{R3}		3.0	mA
		$V_{RM} = 6$ V (pk)	I_{R4}		2.0	mA
1N5819-1, 1N5819UR-1		$V_{RM} = 45$ V (pk)	I_{R2}		5.0	mA
		$V_{RM} = 40$ V (pk)	I_{R3}		4.5	mA
		$V_{RM} = 35$ V (pk)	I_{R4}		4.0	mA
		$V_{RM} = 24$ V (pk)	I_{R5}		3.5	mA
		$V_{RM} = 12$ V (pk)	I_{R6}		2.5	mA
		$V_{RM} = 6$ V (pk)	I_{R7}		2.0	mA
Reverse current leakage	4016					
1N6761-1, 1N6761UR-1		$V_{RM} = 100$ V (pk)	I_{R2}		12.0	mA
		$V_{RM} = 50$ V (pk)	I_{R3}		5.0	mA
		$V_{RM} = 25$ V (pk)	I_{R4}		3.5	mA
		$V_{RM} = 12$ V (pk)	I_{R5}		2.5	mA

See footnote at end of table.

TABLE I. Group A inspection – Continued.

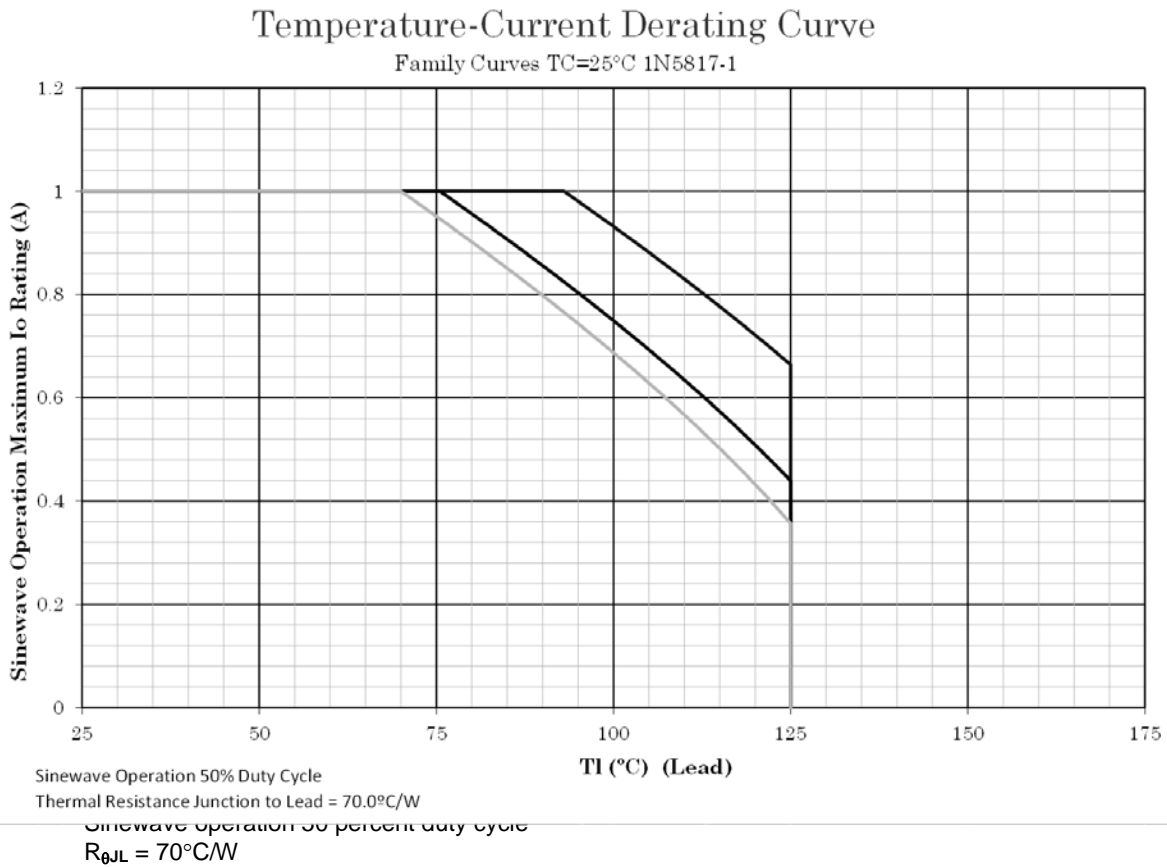
Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Condition		Min	Max	
<u>Subgroup 3</u> - Continued						
Forward voltage 1N5817-1, 1N5817UR-1 1N5819-1, 1N5819UR-1 1N6761-1, 1N6761UR-1	4011	$I_F = 1.0 \text{ A (pk)}$ Pulse method (see 4.5.1)	V_{F4}		.40 .45 .64	V dc V dc V dc
Low temperature operation:		$T_A = -55^\circ\text{C}$				
Forward voltage 1N5817-1, 1N5817UR-1 1N5819-1, 1N5819UR-1 1N6761-1, 1N6761UR-1	4011	$I_F = 1.0 \text{ A (pk)}$ Pulse method (see 4.5.1)	V_{F5}		.60 .65 .80	V dc V dc V dc
Reverse current leakage 1N5817-1, 1N5817UR-1 1N5819-1, 1N5819UR-1 1N6761-1, 1N6761UR-1	4016	$V_{RM} = 20 \text{ V (pk)}$ $V_{RM} = 45 \text{ V (pk)}$ $V_{RM} = 90 \text{ V (pk)}$	I_R		100 200 400	μA μA μA
<u>Subgroup 4</u>						
Capacitance 1N5817-1, 1N5817UR-1 1N5819-1, 1N5819UR-1 1N6761-1, 1N6761UR-1	4001	$V_R = 5 \text{ V dc}$, $.01 \leq f \leq 1 \text{ MHz}$, $V_{SIG} = 15 \text{ mV p-p}$	C_T		110 70 70	pF pF pF

1/ For sampling plan, see MIL-PRF-19500.

2/ Electrical characteristics for all UR devices are identical to the corresponding axial leaded devices unless otherwise specified.

TABLE II. Group E inspection (all quality levels) for qualification and re-qualification.

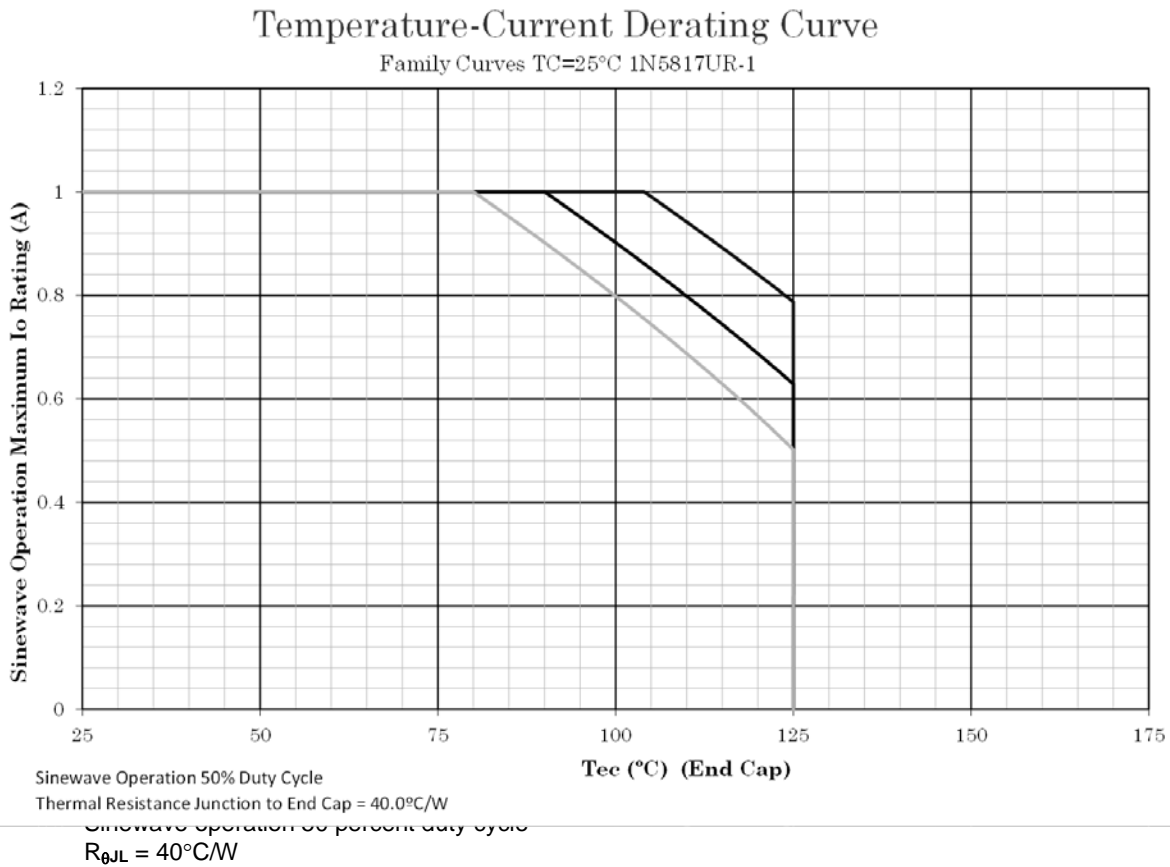
Inspection	MIL-STD-750		Sampling plan
	Method	Conditions	
<u>Subgroup 1</u>			45 devices c = 0
Thermal shock	1056	100 cycles 0°C to 100°C.	
Temperature cycling	1051	500 cycles -65°C to 150°C.	
Hermetic seal	1071	Test condition E.	
Electrical measurement		See table I , subgroup 2.	
<u>Subgroup 2</u>			45 devices c = 0
Intermittent operating life	1036	10,000 cycles, $I_f = 1$ A dc, $T_{on} = T_{off} = 1$ minute.	
Electrical measurement		See table I , subgroup 2.	
<u>Subgroup 4</u>			Sample size N/A
Thermal impedance curves		See MIL-PRF-19500 .	
<u>Subgroup 5</u>			
Not applicable			
<u>Subgroup 6</u>			11 devices
ESD	1020		
<u>Subgroup 8</u>			45 devices c = 0
Resistance to glass cracking	1057	Test condition B. Test to destruction or 25 cycles max whichever comes first.	



NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.
3. Applies to 1N5817-1 up to 20V max.

FIGURE 4. Derating for 1N5817-1 (DO-41).



The curve for $V_R = 6V$ coincides with the curve for $V_R = 12V$.

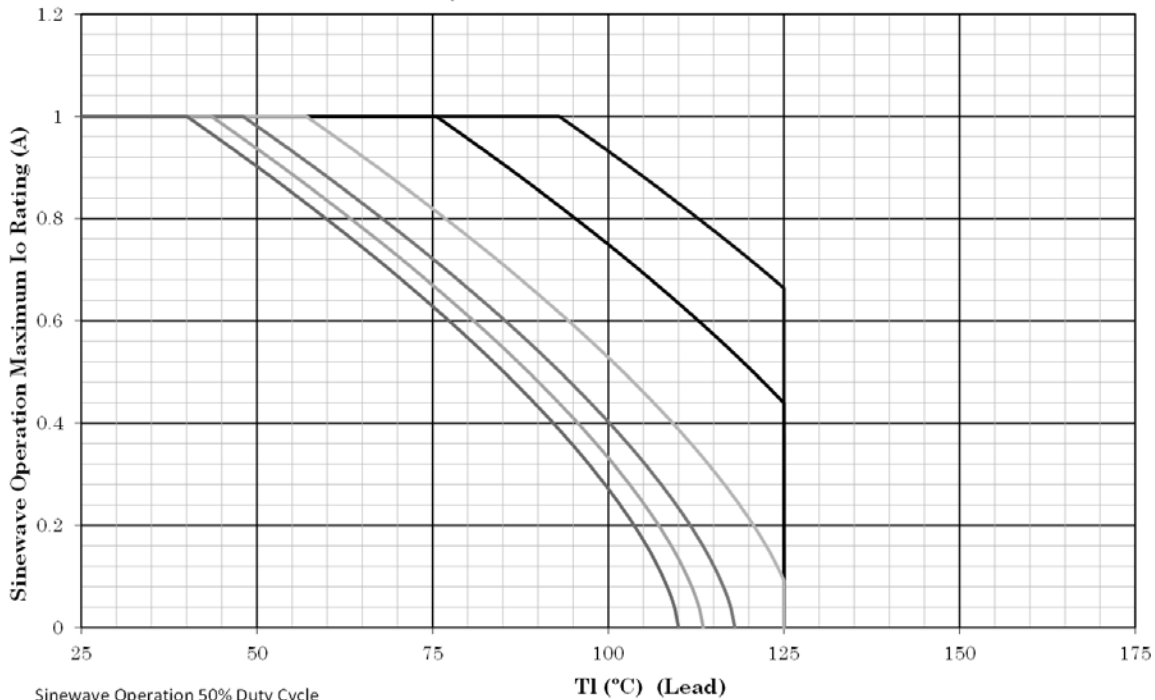
NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.
3. Applies to 1N5817UR-1 only up to 20V max.

FIGURE 5. Derating for 1N5817UR-1 (DO-213AB).

Temperature-Current Derating Curve

Family Curves $T_C=25^\circ\text{C}$ 1N5819-1



Sine wave Operation 50% Duty Cycle

Thermal Resistance Junction to Lead = 70.0°C/W

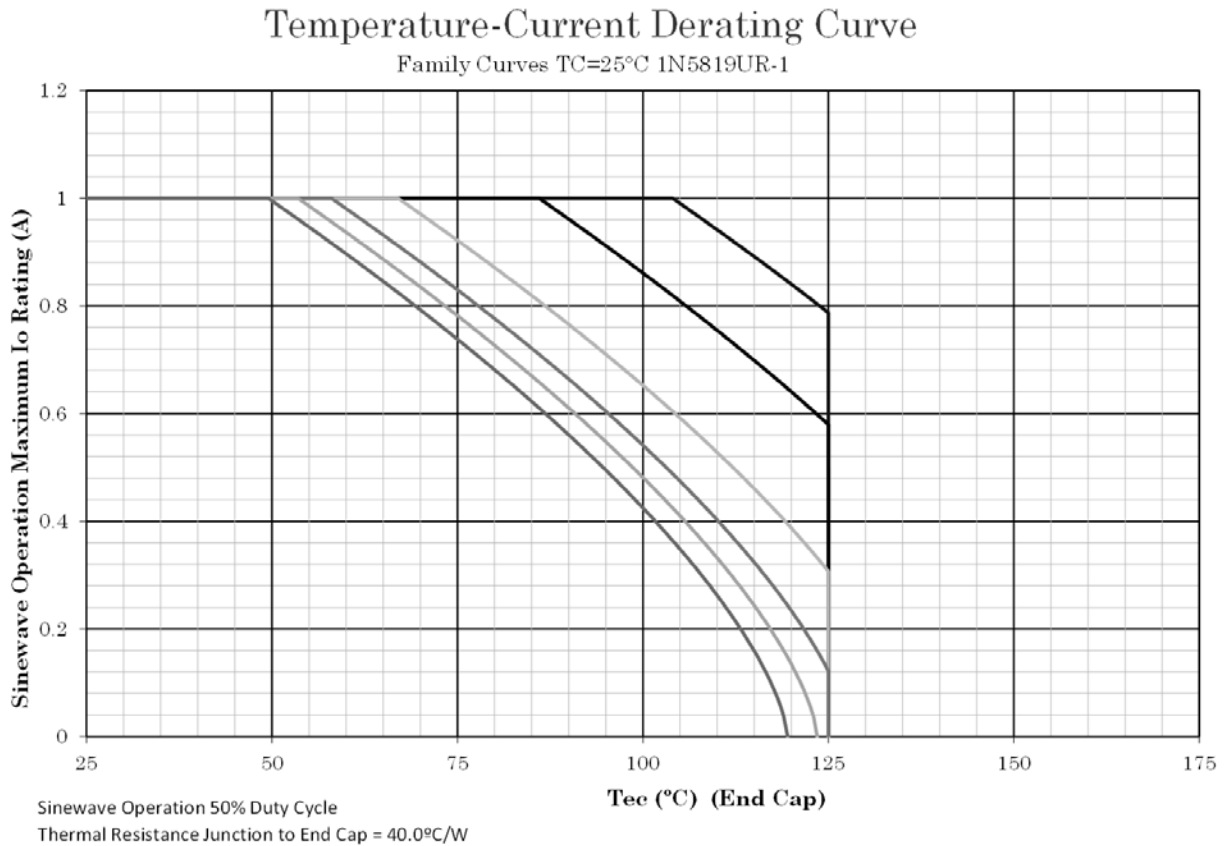
Sine wave operation 50 percent duty cycle

$R_{\theta JL} = 70^\circ\text{C/W}$

NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.

FIGURE 6. Derating for 1N5819-1 (DO-41).



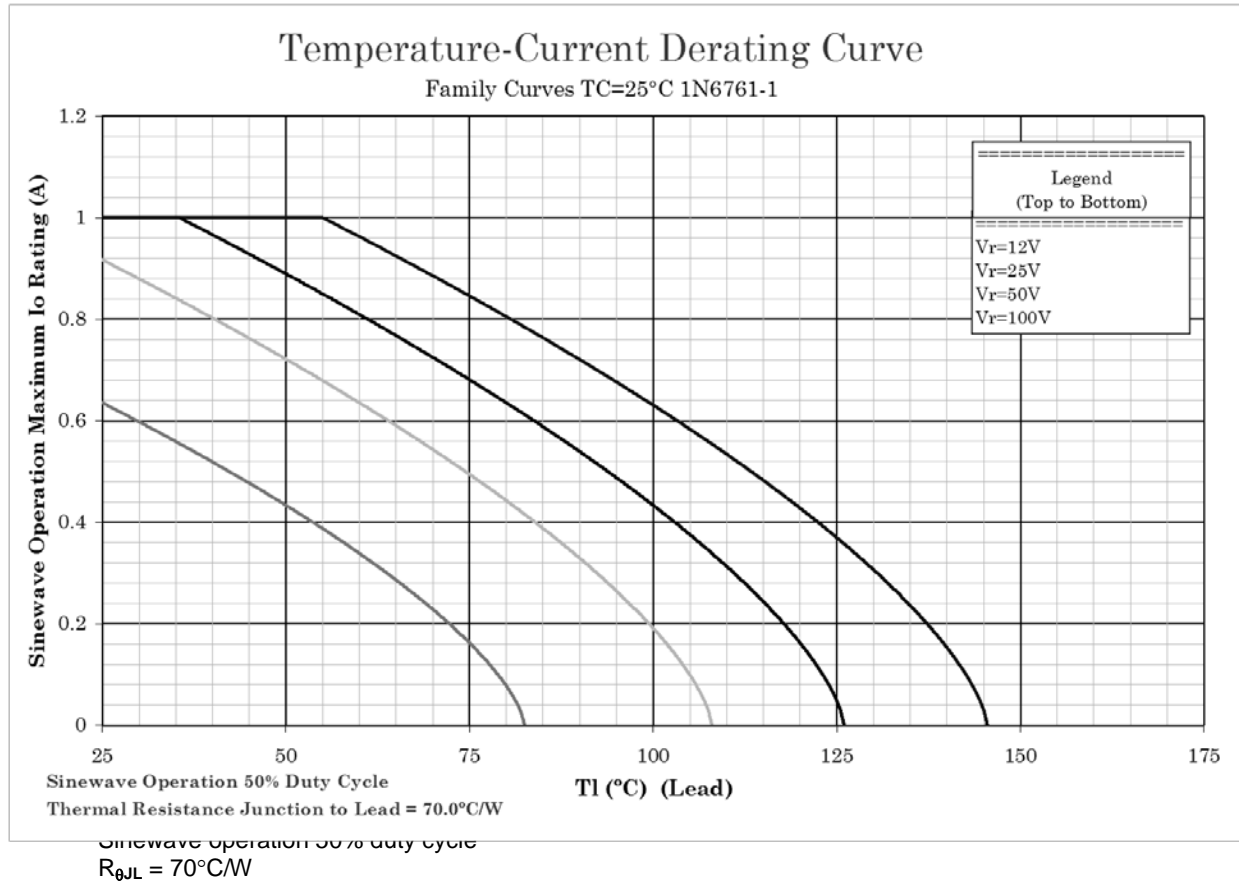
Sinewave operation 50 percent duty cycle
 $R_{\theta JL} = 40^\circ\text{C/W}$

The curve for $V_R = 6\text{V}$ coincides with the curve for $V_R = 12\text{V}$.

NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.

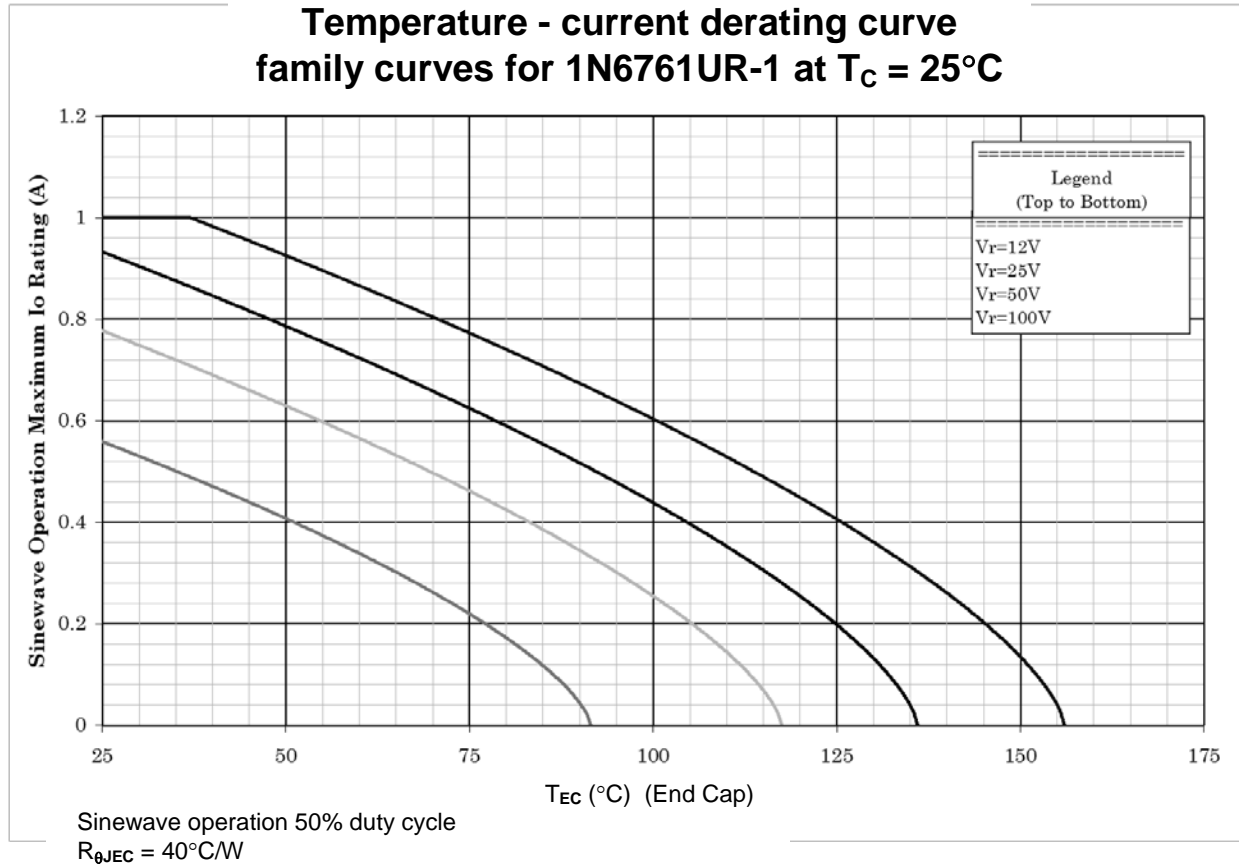
FIGURE 7. Derating for 1N5819UR-1 (DO-213AB).



NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.

FIGURE 8. Derating for 1N6761-1 (DO-41).

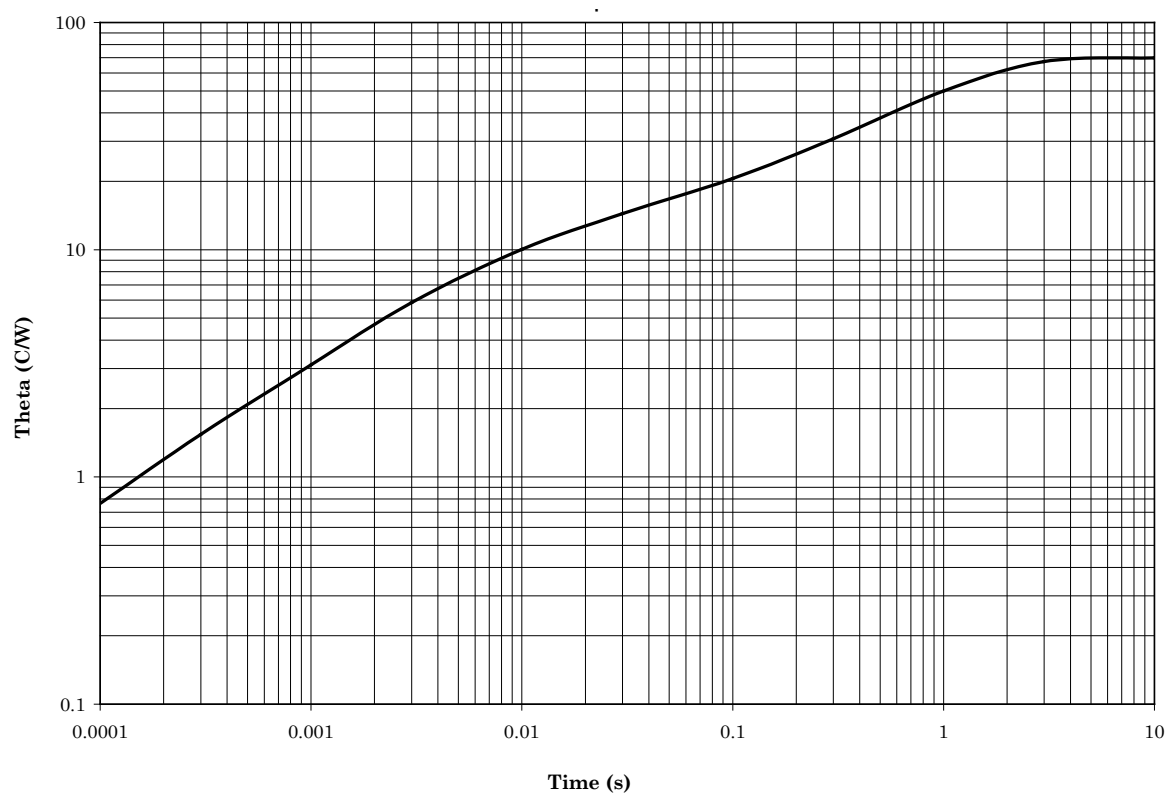


NOTES:

1. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate current for the desired maximum T_J allowed.
2. This temperature-current derating curve varies with applied voltage.

FIGURE 9. Derating for 1N6761UR-1 (DO-213AB).

1N5817-1, 1N5819-1, 1N6761-1
 $T_L = 25^\circ\text{C}$

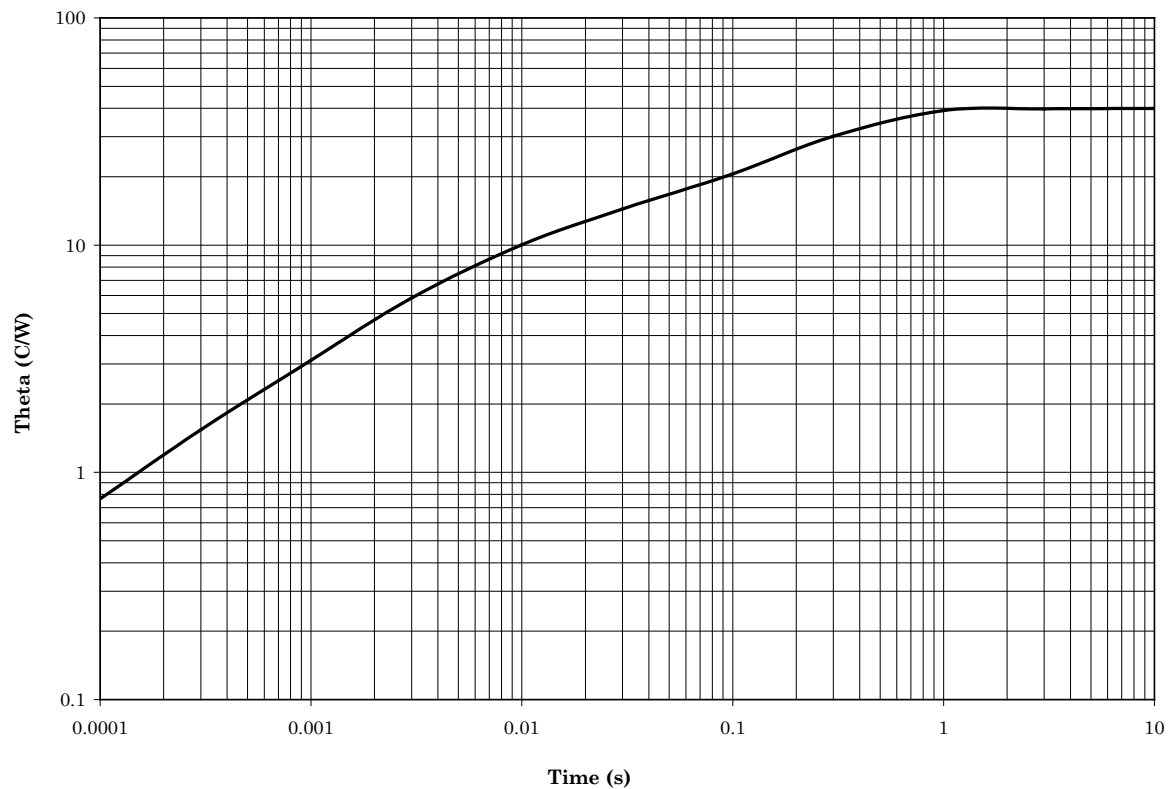


$R_{\theta JL} = 70^\circ\text{C/W}$.

$Z_{\theta JX} = 10^\circ\text{C/W}$ maximum at $t_H = 10\text{ms}$.

FIGURE 10. Thermal impedance for 1N5817-1, 1N5819-1 and 1N6761-1 (DO-41).

1N5817UR-1, 1N5819UR-1, 1N6761UR-1
 $T_{EC} = 25^{\circ}\text{C}$



$R_{\theta JEC} = 40^{\circ}\text{C/W}$.

$Z_{\theta JX} = 10^{\circ}\text{C/W}$ maximum at $t_H = 10\text{ms}$.

FIGURE 11. Thermal impedance for 1N5817UR-1, 1N5819UR-1 and 1N6761UR-1 (DO-213AB).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory. The notes specified in [MIL-PRF-19500](#) are applicable to this specification.)

6.1 Intended use. Semiconductors conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Lead finish (see [3.4.1](#)).
- c. Packaging requirements (see 5.1).
- d. The complete Part or Identifying Number (PIN), see title and section [1](#).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List ([QML-19500](#)) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DLA Land and Maritime, ATTN: VQE, P.O. Box 3990, Columbus, OH 43218-3990 or e-mail vqe.chief@dla.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.dla.mil>.

6.4 Suppliers of die. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHCA1N5819) will be identified on the QML.

PIN	Manufacturer	
	43611	52GC4
1N5817	JANHCA1N5817, JANKCA1N5817	JANHCB1N5817, JANKCB1N5817
1N5819	JANHCA1N5819, JANKCA1N5819	JANHCB1N5819, JANKCB1N5819
1N6761	JANHCA1N6761, JANKCA1N6761	JANHCB1N6761, JANKCB1N6761

6.5 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

Custodians:

Army – CR
Navy – EC
Air Force – 85
NASA – NA
DLA – CC

Preparing activity:

DLA – CC

(Project 5961–2013–037)

Review activities:

Army – AR, MI, SM
Navy – AS, MC
Air Force – 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.